

Section II. (REMARKS)

The pending claims in the application are 1-16, 18, 20-41, 43, and 45-63.

Allowable Subject Matter

In the May 16, 2007 Office Action, the Examiner indicated that claim 57 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants acknowledge same.

Amendment to Claim 55

Claim 55 has been amended to become a method claim and to depend from claim 56. Support for this amendment can be found in the instant application at paragraphs [0047] and [0048].

No new matter has been added herein.

Rejection of Claims and Traversal Thereof

In the November 16, 2005 Office Action:

claims 1-16, 18, 20-41, 43, 45-54 and 60-63 were rejected under 35 U.S.C. §112, first paragraph;

claim 45 was rejected under 35 U.S.C. §112, second paragraph;

claims 56, 58 and 59 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mullee et al. (U.S. Patent No. 6,500,605) in view of Hayasaki et al. (U.S. Patent No. 7,018,481); and

claims 62-63 were rejected under 35 U.S.C. §103(a) as being unpatentable over Reid et al. (U.S. Patent No. 6,958,123); and

claim 55 was rejected under 35 U.S.C. §103(a) as being unpatentable over DeYoung et al. (U.S.

Patent No. 6,669,785) in view of McClain et al. (U.S. Patent No. 6,623,355) in further view of DeYoung et al. (U.S. Patent No. 7,044,143).

These rejections are traversed and reconsideration of the patentability of the pending claims is requested in light of the following remarks.

Rejection under 35 U.S.C. §112, first paragraph

In the May 16, 2007 Office Action, claims 1-16, 18, 20-41, 43, 45-54 and 60-63 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner stated that the recital of “polymer species” in each of claims 1, 25 and 62 was not supported in the specification and is therefore considered new matter.

Applicants have amended claims 1 and 25 to recite that the “binder is derived from at least one ethylenically unsaturated reactant.” Support for this amendment can be found in the instant specification at paragraph [0031] which recites that “[t]he binder of the present invention may be derived from at least one ethylenically unsaturated reactant.”

Applicants have amended claim 62 to recite that the “binder comprises a species selected from the group consisting of polymeric alcohol and polymeric amine.” Support for this amendment can be found in the instant specification at paragraph [0031] which recites that in a preferred embodiment, the binder is a polymeric alcohol or a polymeric amine.

Withdrawal of the rejection of claims 1-16, 18, 20-41, 43, 45-54 and 60-63 under 35 U.S.C. §112, first paragraph, is respectfully requested.

Rejection under 35 U.S.C. §112, second paragraph

In the May 16, 2007 Office Action, claim 45 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 45 has been amended to recite “polyvinyl alcohol” instead of “polymeric alcohol,” thereby obviating this rejection.

Withdrawal of the rejection of claim 45 under §112, second paragraph, is respectfully requested.

Rejections under 35 U.S.C. §103

1. In the May 16, 2007 Office Action, claims 56, 58 and 59 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mullee et al. (U.S. Patent No. 6,500,605) (hereinafter Mullee '605) in view of Hayasaki et al. (U.S. Patent No. 7,018,481) (hereinafter Hayasaki). Applicants traverse such rejection.

Claim 56 has been amended herein to recite, *inter alia*:

"pre-cleaning the wafer surface with a SCF-based pre-cleaning composition comprising supercritical carbon dioxide (SCCO₂) and an aqueous-based pre-cleaning formulation, wherein the aqueous-based pre-cleaning formulation comprises an oxidizing agent and the SCCO₂ comprises at least 95 wt% of the SCF-based pre-cleaning composition . . ." (emphasis showing added limitation(s))

By the Examiner's own admission, Mullee '605 fails to disclose a pre-cleaning step comprising a SCF based pre-cleaning composition and an aqueous-based pre-cleaning composition comprising an oxidizing agent. According to the Examiner, Hayasaki cures this deficiency. Applicants disagree.

Specifically, the Examiner stated that

"Hayasaki teaches, in an analogous art, a pretreatment method comprising an ozone water . . . Hayashi [sic] also teaches a cleaning treatment comprising any cleaning solution such as a reducing solution, oxidizing solution (ozone water, oxygen water), weak alkali ion water, slightly acidic ion water, supercritical water, carbonated water, hydrogen water, and pure water, and combinations of these solution [sic] so that the cleaning effect is raised (see col. 26, lines 55-67)."

As introduced hereinabove, claim 56 has been amended to recite that the SCF-based pre-cleaning composition comprises at least 95 wt% SCCO₂, based on the total weight of the pre-cleaning composition. Reviewing the teaching in Hayasaki, it is very clear that the cleaning solutions are

all water-based (e.g., ozone water, oxygen water, weak alkali ion water, slightly acidic ion water, supercritical water, carbonated water, hydrogen water, and pure water), in contrast to applicants' pre-cleaning composition which is CO₂-based.

Moreover, there is no reason why one skilled in the art considering Hayasaki would think to use a SCCO₂-based pre-cleaning formulation including an oxidizing agent.

It is well established in the caselaw that one of the requirements needed to establish a *prima facie* case of obviousness is that each and every limitation be motivated, taught or suggested.¹ See, *In re Royka*, 180 USPQ 580 (CCPA 1974). Clearly, Mullee '605 in view of Hayasaki does not satisfy this standard.

It is further noted that claims 58 and 59 recite pre-cleaning pressure and temperature ranges of about 1200 psi to about 2900 psi and about 40°C to about 60°C, respectively. Supercritical water has a critical pressure of 3200 psi and a critical temperature of 374°C. As such, at the pre-cleaning conditions of claims 58 and 59, water is not even in the supercritical state. Accordingly, Hayasaki does not cure the deficiencies of Mullee '605 with respect to claims 58 and 59.

In conclusion, since the combination of Mullee '605 and Hayasaki fail to motivate, teach or suggest each and every limitation of applicants' claimed invention, applicants request withdrawal of the objection of claims 56, 58 and 59 under 35 U.S.C. §103(a) over Mullee '605 in view of Hayasaki.

2. In the May 16, 2007 Office Action, claims 62-63 were rejected under 35 U.S.C. §103(a) as being unpatentable over Reid et al. (U.S. Patent No. 6,958,123) (hereinafter Reid). Applicants traverse such rejection.

Reid relates to a method for releasing a micromechanical structure. The simplest way to describe the teaching of Reid is to refer to claim 1 in combination with figures 1A-1E, which recites:

¹ It is noted that subsequent to the recent Supreme Court decision in *KSR Int'l Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. 2007), the USPTO issued a memorandum that stated that "the Court did not totally reject the use of 'teaching, suggestion, or motivation' as a factor in the obviousness analysis" and that "in formulating a rejection used 35 U.S.C. §103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed" (emphasis in original).

"1. A method comprising:

depositing an organic material (14) on a substrate (10);



FIG. 1B

depositing additional material (18, 20, 22) different from said organic material after depositing the organic material; and

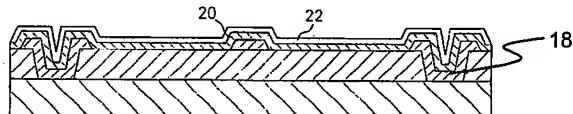


FIG. 1D

removing the organic material (14) with a compressed fluid;

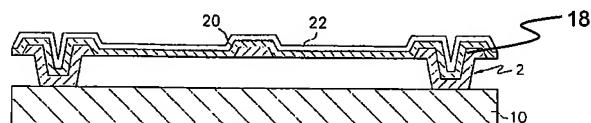


FIG. 1E

wherein the released and movable additional material forms a micromirror for a display system or optical switch."

In other words, the teaching of Reid relates, in part, to the removal of sacrificial organic material (14), leaving behind the additional layers including first layer (18) (e.g., silicon nitride or silicon oxide), the second layer (20) (e.g., silicon nitride, silicon oxide, silicon carbide, polysilicon) and the reflective and conductive layer (22) (e.g., gold, aluminum or other metal).

According to the Examiner in the May 16, 2007 Office Action:

"Reid teaches the ingredients of the compositions which are supercritical fluid (see col. 6, lines 13-17), polymer like polyvinyls (see col. 6, line 34) and silicon nitride (see claim 26).

Applicants vigorously disagree.

Claim 26, in combination with claim 25 from which it depends, recites that the additional material comprises silicon nitride. The additional material is the material that is not removed

using the compressed fluid but rather is intended to remain following the removal of the sacrificial inorganic material.

Moreover, the teaching of the supercritical fluid and the polymer like polyvinyls at column 6 relate to a deposition composition for the deposition of the organic sacrificial layer. Every recitation in Reid relating to the deposition of silicon nitride discloses the use of sputtering, LPCVD or PECVD (see, e.g., Reid, col. 3, lines 12-14, line 38, etc.).

The Examiner is respectfully reminded that prior art references must be considered as a whole.² In the present case, respectfully, the Examiner has not considered Reid as a whole and has instead taken it out of context in an attempt to establish a *prima facie* case of obviousness.

Specifically, the Examiner has attempted to combine the silicon nitride additional material, which is deposited using sputtering or CVD techniques, with the deposition of the organic sacrificial material using supercritical fluids. Clearly, Reid does not actually disclose (1) a composition including supercritical fluids, polymer like polyvinyls and silicon nitride, but rather a composition that may include supercritical fluids and polymer like polyvinyls for the deposition of an organic sacrificial layer and (2) the separate chemical vapor deposition of silicon nitride.

Moreover, the removal of the sacrificial layer using a supercritical fluid includes the removal of just the organic layer, not the additional material layers that may include silicon nitride. The additional material layers make up the MEMS device.

Accordingly, Reid does not motivate, teach or suggest each and every limitation of applicants' claims 62 and 63 and as such, a *prima facie* case of obviousness was not established. Withdrawal of the rejection of claims 62 and 63 under §103 in view of Reid is respectfully requested.

3. In the May 16, 2007 Office Action, claim 55 was rejected under 35 U.S.C. §103(a) as being unpatentable over DeYoung et al. (U.S. Patent No. 6,669,785) (hereinafter DeYoung '785) in view of McClain et al. (U.S. Patent No. 6,623,355) (hereinafter McClain) in further view of DeYoung et al. (U.S. Patent No. 7,044,143) (hereinafter DeYoung '143).

² *W.L. Gore & Associates, Inc., v. Garlock, Inc.*, 220 U.S.P.Q. 303 (Fed. Cir. 1993), cert. denied, 469 U.S. 851 (1984)

Claim 55 has been amended to become a method claim and to depend from claim 56, thereby obviating this rejection.

Conclusion

Claims 1-16, 18, 20-41, 43, and 45-63 are now in form and condition for allowance. Favorable action is hereby requested. Authorization is hereby given to charge any deficiency in applicable fees for this response to Deposit Account No. 13-4365 of Moore & Van Allen PLLC. If any additional issues remain, the Examiner is requested to contact the undersigned attorney at (919) 286-8090 to discuss same.

Respectfully submitted,
MOORE & VAN ALLEN PLLC

Date: July 16, 2007

By: Tristan A. Fuierer
Tristan Anne Fuierer
Registration No. 52,926
Moore & Van Allen PLLC
430 Davis Drive, Suite 500
Morrisville, NC 27560-6832
Telephone: (919) 286-8000
Facsimile: (919) 286-8199